

# Notice of Allowability

Application No.

10/759,750

Examiner

Krishnan S. Menon

Applicant(s)

HERRINGTON ET AL.

Art Unit

1723

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment of 2/15/07.
2. ☒ The allowed claim(s) is/are 1-30.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All b) ☐ Some\* c) ☐ None of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

## Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

Krishnan S Menon  
Primary Examiner  
Art Unit: 1723

### **EXAMINER'S AMENDMENT**

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Phillip Askanezy on 3/2/07, and follow-up e-mail communication, which is entered.

The application has been amended as follows:

A list of Amended Claims follow starting on a fresh page below.

The following is an examiner's statement of reasons for allowance: The closest prior arts do not teach the DPA valve as claimed, singly or in combination with the valve disposed downstream of the retentate chamber with respect to the retentate flow.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Amended Claims List***

1. (currently amended) A membrane filtration system comprising:
  - a first piston, said first piston separating a feed chamber from a retentate chamber;
  - a membrane filtration element; and
  - a differential pressure activated (DPA) valve which controls retentate discharge, said DPA valve disposed downstream of said membrane filtration element and said retentate chamber with respect to a flow of retentate, said DPA valve comprising:
    - a single housing comprising a port in fluid connection with an inlet to said filtration element, an inlet port for receiving retentate from said filtration element, and a retentate discharge port; and
    - a single second piston slideably disposed within said single housing, said second piston positively sealing said inlet port when a feed pressure on a first face of said second piston exceeds a retentate pressure on a second face of said second piston;
- wherein pressure recovery is provided by a pressure difference between the feed chamber and the retentate chamber acting on said first piston.

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2. (original) The membrane filtration system of claim 1 wherein the DPA valve is hydraulically operated.

3. (original) The membrane filtration system of claim 1 wherein operation of the DPA valve is determined by relative pressure in the feed chamber and the retentate chamber.

4. (previously presented) The membrane filtration system of claim 3 wherein the DPA valve operates automatically in accordance with pumping of said first piston.

5. (previously presented) The membrane filtration system of claim 1 wherein said first piston comprises a piston shaft.

6. (original) The membrane filtration system of claim 5 wherein a recovery ratio of the membrane filtration element is determined by a cross-sectional area of the piston shaft.

7. (original) The membrane filtration system of claim 6 wherein the piston shaft is easily replaceable, thereby enabling rapid change of the recovery ratio.

8. (original) The membrane filtration system of claim 1 further comprising a pressure relief valve.

9. (original) The membrane filtration system of claim 1 comprising a single cylinder.

10. (original) The membrane filtration system of claim 1 having a diameter of less than approximately four inches.

11. (original) The membrane filtration system of claim 10 having a diameter of less than approximately two inches.

12. (original) The membrane filtration system of claim 1 having a length of less than approximately twenty-four inches.

13. (original) The membrane filtration system of claim 12 having a length of less than approximately fifteen inches.

14. (original) The membrane filtration system of claim 1 having a weight of less than five pounds.

15. (original) The membrane filtration system of claim 14 having a weight of less than three pounds.

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16. (original) The membrane filtration system of claim 1 wherein said membrane filtration element comprises a reverse osmosis element.

17. (original) The membrane filtration system of claim 16 wherein said reverse osmosis element comprises a spiral wrapped element.

18. (original) The membrane filtration system of claim 17 wherein said spiral wrapped element comprises:

at least one membrane; and

at least one thin feed spacer.

19. (original) The membrane filtration element of claim 18 wherein said at least one thin feed spacer comprises a plastic web mesh.

20. (original) The membrane filtration system of claim 18 wherein said at least one thin feed spacer is less than approximately .025 inches thick.

21. (original) The membrane filtration system of claim 20 wherein said at least one thin feed spacer is less than approximately .011 inches thick.

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22. (original) The filtration system of claim 18 wherein said at least one thin feed spacer provides for a reduction in an amount of total dissolved solids at a surface of said membrane.

23. (original) The filtration system of claim 1 wherein the pressure recovery is great enough to enable manual operation of the system.

24. (original) The filtration system of claim 23 wherein the pressure recovery is about fifty percent.

25. (currently amended) A method of filtering a substance comprising the steps of:

pumping the substance with a first piston, wherein the first piston separates a feed chamber and a retentate chamber;

passing the substance through at least one membrane filtration element, thereby separating the substance into permeate and retentate; and

discharging the retentate using a differential pressure activated (DPA) valve, the DPA valve disposed downstream of the membrane filtration element and the retentate chamber with respect to a flow of the retentate, the DPA valve comprising:

a single housing comprising a port in fluid connection with an inlet to said filtration element, an inlet port for receiving retentate from said filtration element, and a retentate discharge port; and

a single second piston slideably disposed within said single housing, said second piston positively sealing said inlet port when a feed pressure on a first face of said second piston exceeds a retentate pressure on a second face of said second piston.

26. (original) The method of claim 25 wherein the passing step comprises passing the substance through a reverse osmosis filtration element.

27. (original) The method of claim 25 wherein the discharging step comprises operating the DPA valve hydraulically.

28. (original) The method of claim 25 wherein the discharging step comprising operating the DPA valve according to the relative pressure in the feed chamber and the retentate chamber.

29. (original) The method of claim 28 wherein the discharging step comprising operating the DPA valve automatically as the substance is pumped.

30. (previously presented) The method of claim 25 wherein the pumping step comprises utilizing a pressure difference between the feed chamber and the retentate chamber acting on said first piston to reduce the force necessary to pump the substance.




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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S. Menon whose telephone number is 571-272-1143. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Krishnan S Menon  
Primary Examiner  
Art Unit 1723  
3/5/07

## Menon, Krishnan

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**From:** Phil Askenazy [PAskenazy@peacocklaw.com]  
**Sent:** Friday, March 02, 2007 2:50 PM  
**To:** Menon, Krishnan  
**Subject:** RE: Authorization of email communication

Examiner Menon:

Attached are the proposed amendments for these two applications. I have tried to make changes to all of the independent claims as you indicated. Note also that in the '753 application I canceled claims 65, 66, and 68 since they have now been included in the independent claims.

Please let me know if these amendments are acceptable.

Thank you very much,

Phil

*Philip D. Askenazy, Ph.D.*

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**\*NOTE\***

**The attorney-client privilege and/or the attorney work product doctrine apply to this communication, including all attachments hereto. Furthermore, the communication is confidential and intended only for the named recipient.**

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**From:** Menon, Krishnan [mailto:Krishnan.Menon@USPTO.GOV]  
**Sent:** Monday, February 26, 2007 4:21 PM  
**To:** Phil Askenazy  
**Cc:** Menon, Krishnan  
**Subject:** RE: Authorization of email communication

The following is a summary of an examiner initiated interview on 2/26/07 between Mr. Philip Askenazy and Examiner Menon regarding Application numbers:  
 10/759,750 and 10/759,753

10/759, 750:

Independent claims 1 and 25 could be made in condition for allowance if the claims were amended to include the location of the DPA valve as downstream of the membrane and the retentate chamber of the pump with respect to the retentate flow.

10/759,753:

Independent claims could be made in condition for allowance by further limiting the DPA valve as follows:

Wherein the DPA valve comprises a single piston slideably disposed in a single chamber;  
the piston having a feed side and a retentate side;  
the chamber having a feed inlet port, a retentate inlet port and a retentate discharge port;  
the feed side area of the piston being larger than the retentate side area to keep the retentate port sealed during the compression stroke.

Krishnan S. Menon  
Primary Examiner  
AU 1723.

-----Original Message-----

**From:** Phil Askenazy [mailto:PAskenazy@peacocklaw.com]

**Sent:** Monday, February 26, 2007 5:22 PM

**To:** Menon, Krishnan

**Subject:** Authorization of email communication

Dear Examiner Menon:

This email is to authorize email communication on the following patent applications:

10/759,750

10/759,753

Thank you,

Philip Askenazy

*Philip D. Askenazy, Ph.D.*

Registered Patent Agent

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**\*NOTE\***

**The attorney-client privilege and/or the attorney work product doctrine apply to this communication, including all attachments hereto. Furthermore, the communication is confidential and intended only for the named recipient.**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No. : 10/759,750  
Applicant : Rodney E. Herrington  
Filed : January 16, 2004  
Title : PUMPS FOR FILTRATION SYSTEMS

TC/A.U. : 1723  
Examiner : Krishnan S. Menon  
Confirm. No. : 8349

Docket No. : 30750-1001

Commissioner for Patents  
United States Patent and Trademark Office  
PO Box 1450  
Alexandria, Virginia 22313-1450

**PROPOSED CLAIMS FOR EXAMINER'S AMENDMENT**

Sir:

In response to the examiner initiated interview on 2/26/07, the following proposed claims are submitted per the Examiner's request.

**Proposed Amendments to the Claims**

1. (currently amended) A membrane filtration system comprising:

a first piston, said first piston separating a feed chamber from a retentate chamber;

a membrane filtration element; and

a differential pressure activated (DPA) valve which controls retentate discharge, said DPA valve disposed downstream of said membrane filtration element and said retentate chamber with respect to a flow of retentate, said DPA valve comprising:

a single housing comprising a port in fluid connection with an inlet to said filtration element, an inlet port for receiving retentate from said filtration element, and a retentate discharge port;  
and

a single second piston slideably disposed within said single housing, said second piston positively sealing said inlet port when a feed pressure on a first face of said second piston exceeds a retentate pressure on a second face of said second piston;

wherein pressure recovery is provided by a pressure difference between the feed chamber and the retentate chamber acting on said first piston.

2. (original) The membrane filtration system of claim 1 wherein the DPA valve is hydraulically operated.

3. (original) The membrane filtration system of claim 1 wherein operation of the DPA valve is determined by relative pressure in the feed chamber and the retentate chamber.

4. (previously presented) The membrane filtration system of claim 3 wherein the DPA valve operates automatically in accordance with pumping of said first piston.

5. (previously presented) The membrane filtration system of claim 1 wherein said first

piston comprises a piston shaft.

6. (original) The membrane filtration system of claim 5 wherein a recovery ratio of the membrane filtration element is determined by a cross-sectional area of the piston shaft.

7. (original) The membrane filtration system of claim 6 wherein the piston shaft is easily replaceable, thereby enabling rapid change of the recovery ratio.

8. (original) The membrane filtration system of claim 1 further comprising a pressure relief valve.

9. (original) The membrane filtration system of claim 1 comprising a single cylinder.

10. (original) The membrane filtration system of claim 1 having a diameter of less than approximately four inches.

11. (original) The membrane filtration system of claim 10 having a diameter of less than approximately two inches.

12. (original) The membrane filtration system of claim 1 having a length of less than approximately twenty-four inches.

13. (original) The membrane filtration system of claim 12 having a length of less than approximately fifteen inches.

14. (original) The membrane filtration system of claim 1 having a weight of less than five

pounds.

15. (original) The membrane filtration system of claim 14 having a weight of less than three pounds.

16. (original) The membrane filtration system of claim 1 wherein said membrane filtration element comprises a reverse osmosis element.

17. (original) The membrane filtration system of claim 16 wherein said reverse osmosis element comprises a spiral wrapped element.

18. (original) The membrane filtration system of claim 17 wherein said spiral wrapped element comprises:

at least one membrane; and

at least one thin feed spacer.

19. (original) The membrane filtration element of claim 18 wherein said at least one thin feed spacer comprises a plastic web mesh.

20. (original) The membrane filtration system of claim 18 wherein said at least one thin feed spacer is less than approximately .025 inches thick.

21. (original) The membrane filtration system of claim 20 wherein said at least one thin feed spacer is less than approximately .011 inches thick.

22. (original) The filtration system of claim 18 wherein said at least one thin feed spacer



provides for a reduction in an amount of total dissolved solids at a surface of said membrane.

23. (original) The filtration system of claim 1 wherein the pressure recovery is great enough to enable manual operation of the system.

24. (original) The filtration system of claim 23 wherein the pressure recovery is about fifty percent.

25. (currently amended) A method of filtering a substance comprising the steps of:

- pumping the substance with a first piston, wherein the first piston separates a feed chamber and a retentate chamber;
- passing the substance through at least one membrane filtration element, thereby separating the substance into permeate and retentate; and
- discharging the retentate using a differential pressure activated (DPA) valve, the DPA valve disposed downstream of the membrane filtration element and the retentate chamber with respect to a flow of the retentate, the DPA valve comprising:
  - a single housing comprising a port in fluid connection with an inlet to said filtration element, an inlet port for receiving retentate from said filtration element, and a retentate discharge port;
  - and
  - a single second piston slideably disposed within said single housing, said second piston positively sealing said inlet port when a feed pressure on a first face of said second piston exceeds a retentate pressure on a second face of said second piston.

26. (original) The method of claim 25 wherein the passing step comprises passing the substance through a reverse osmosis filtration element.

27. (original) The method of claim 25 wherein the discharging step comprises operating the DPA valve hydraulically.

28. (original) The method of claim 25 wherein the discharging step comprising operating the DPA valve according to the relative pressure in the feed chamber and the retentate chamber.

29. (original) The method of claim 28 wherein the discharging step comprising operating the DPA valve automatically as the substance is pumped.

30. (previously presented) The method of claim 25 wherein the pumping step comprises utilizing a pressure difference between the feed chamber and the retentate chamber acting on said first piston to reduce the force necessary to pump the substance.